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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/200,495	11/25/1998	PETER C. VAN BUSKIRK	2771-337(PC8	4898

25559 7590 05/15/2003

ATMI, INC.  
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DANBURY, CT 06810

EXAMINER

HU, SHOUXIANG

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 05/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/200,495

Applicant(s)

VAN BUSKIRK ET AL.

Examiner

Shouxiang Hu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 40-55 and 61-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 40-55 and 61-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 40-55 and 61-63 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 40 and 63 each recites the subject matter of "an unannealed top electrode", but an adequate support for this subject matter is not found in the original disclosure. While the original disclosure may support the subject matter that substantially stoichiometrical completeness in oxygen concentration of the ferroelectric oxide film can be maintained through the formation of the top electrode in an oxygen-enriched environment, instead of through an annealing in oxygen, it does not necessarily or always mean that there is no any anneal in any environment for the top electrode in the recited microelectronic device structure.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 40-47 and 52-55, insofar as being in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 102(a) as being anticipated by Miki et al. ("Miki"; WO98/01904, Jan. 15, 1998; also see US 6,309,894 for its English translation).

Miki discloses a microelectronic device structure (Figs. 10(1) and 10(2); also see col. 4, lines 34-54, and col. 7, line 59, through col. 8, line 29, in US 6,309,894), comprising: a bottom electrode layer (102), a ferroelectric oxide film (103; lead zirconium titanate (PZT), barium and/or strontium titanates (BST), or strontium bismuth tantakite (SBT); and a top electrode (Pt) formed in an oxygen enriched environment, wherein the ferroelectric film is naturally substantially stoichiometrically complete in oxygen concentration as it can be expressed with the stoichiometrical chemical formulas provided for the ferroelectric film (see col. 4, lines 34-54) and as the top electrode is formed with a method substantially same as the one used in the instant invention.

Regarding the limitation of "unannealed" (such as the one recited in claim 40), and the limitations of deposition methods recited in claims 53-55, these limitations are process limitations that would not carry patentable weight in those claims drawing to a structure, because distinct structure is not necessarily produced. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 48-51 and 61-63, insofar as being in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Miki et al. ("Miki"; WO98/01904, Jan. 15, 1998; also see US 6,309,894 for its English translation) in view Park et al. ("Park"; 5,892,254)

The disclosure of Miki is discussed as applied to claims 40-47 and 52-55 above.

Although Miki does not expressly disclose that the top electrode can also be formed of Pt oxide, Ir, Ir oxide, Rh, or Rh oxide, one of ordinary skill in the art would readily recognize that each of Pt oxide, Ir, Ir oxide, Rh and Rh oxide can be used for the top electrode in a ferroelectric capacitor structure for achieving stable capacitor performance, as evidenced in Park (see col. 1, lines 36-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the microelectronic device of Miki with the top electrode being made of Pt oxide, Ir, Ir oxide, Rh or Rh oxide, as taught in Park, so that a microelectronic device with desired material choice and stable capacitor performance would be obtained.

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***Response to Arguments***

7. Applicant's arguments with respect to claims 40-55 and 61-63 have been considered but are moot in view of the new ground(s) of rejection.

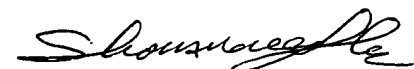
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is (703) 306-5729. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SH  
May 13, 2003



Shouxiang Hu  
Patent Examiner  
TC2800